Field trips, Collecting Equipment, Insect Collections and Reports

FIELD TRIPS

A key objective of this course is to develop an appreciation of the diverse insect fauna of California, and to recognize some of the insect assemblages associated with different habitats. To this end we have organized a series of five all-day field trips to different sites, encompassing a variety of natural habitats. You must attend **at least four** of the five trips (the choices are yours). You should bring the following items on each field trip:

water, lunch
hat and sunscreen
insect collecting equipment (nets, kill jars, vials, notebook, forceps, pen/pencil)

Cautions:

1. **Poison oak** is common at most sites. Learn to recognize this plant, and try to avoid contacting the fresh foliage. You are strongly advised to wear long pants.
2. **Rattlesnakes** also occur at most localities. Wear robust hiking boots, not sandals or other open-toed shoes.
3. **Always roll logs and stones towards you** (not away from you), so that a protective barrier is interposed between you and whatever lurks underneath.
4. **Ticks** are common at all sites. Check yourself thoroughly when you return home.

Field site information

Stebbins Cold Canyon Reserve (field trip #1) is located in the Inner Coast Range, about 32 km west of Davis. Set in a north-south trending canyon, this site contains examples of chaparral, grassland, oak woodland, and riparian vegetation. Differences in slope and exposure are often associated with striking habitat discontinuities. The elevation range is 90 to 760 m. Average annual precipitation is approximately 52 cm (20 in), nearly all of which falls in the cool, wet winter (average January temperature: 6ºC). Summers are hot and dry (average July temperature: 28ºC). More information is available at: http://nrs.ucop.edu/reserves/stebbins.html.

McLaughlin Reserve (field trip #2) is a 2776-hectare site, located at the confluence of Napa, Lake and Yolo Counties, about 2 hours drive west of Davis. The following description is from the reserve web site (http://nrs.ucop.edu/reserves/mclaughlin.html): "The McLaughlin Reserve encompasses several geologic formations, two watersheds (Putah and Cache Creeks), and a variety of vegetation including oak woodland, nonserpentine chaparral, serpentine chaparral, and grasslands. It is one of a few sites in California that protects unusual serpentine habitats. Chemically hostile to most plants, serpentine deposits cover one third of the reserve, creating islands that support rare endemic plants, which have adapted to these harsh soils, and numerous associated endemic insects." The elevation range at McLaughlin Reserve is 365 to 915 m. Average annual precipitation is 62 cm (24 in), with average monthly temperatures of 8ºC and 25ºC in January and July, respectively.

Empire Mine Historic State Park (field trip #3) is a 326-hectare site in Nevada County, in the vicinity of Grass Valley. Although the park was established to protect the historical legacy of one of California's oldest gold mines, it also contains a diverse array of natural habitats including montane meadow, montane wetland shrub habitat, montane fresh water marsh, mixed evergreen forest, montane riparian forest and thickets. Average annual precipitation is 54 cm (21 in). Average monthly temperatures range from 6ºC (January) to 21ºC (July). More information is available at http://www.parks.ca.gov/default.asp?page_id=499.

Del Puerto Canyon (field trip #4) is a rugged canyon in the Inner Coast Range, in western Stanislaus County. Habitats include oak woodland, serpentine chaparral, nonserpentine chaparral, mixed riparian woodland, and grasslands. This is a classic insect collecting site, long frequented by entomologists. In the middle section of the canyon is the 2000-acre Frank Raines Park, where the principal of multiple (ab)use is in effect: 640 acres of the park is reserved for off-road vehicle use **(**ATVs, 4WDs, motorcycles, dune buggies), with the remainder available for less destructive activities. Del Puerto Canyon has a typical Mediterranean climate with wet winters and hot dry summers, although no detailed climatic data are available for the canyon. More on Frank Raines Park at http://www.co.stanislaus.ca.us/er/fraines.htm. Information on birding in Del Puerto Canyon is given at http://www.cvbirds.org/SiteGuides/DPCMR.pdf.

Blodgett Forest Research Station (field trip #5) is a UC Berkeley field station located about 20 km east of Georgetown, in El Dorado County, at about 1300 m elevation, on the west slope of the Sierra Nevada. Here is a description from the station web site (http://www.cnr.berkeley.edu/forestry/properties/blodgett.html): "Blodgett Forest, situated on the Georgetown Divide, consists of high site mixed conifer forest, oak forest, and brushland. Gradients on the gently rolling topography average less than 30 percent. Three major creeks flow through the Forest. Over 400 species of plants on the property provide habitat for 150 species of animals…Annual precipitation averages 166 cm (65") with a range of 580-2740 mm (23 - 108"). Annual snowfall averages 2540 mm (100"). Summer temperatures range from 14-C to 27 C (57-80 degrees F) and winter temperatures from 0 C to 9 C (32-48 degrees F).".

COLLECTING EQUIPMENT

There are certain items of insect collecting equipment that you will need to obtain before the first field trip (April 13). Most of these can be obtained from BioQuip, an entomological supply company in Gardena, California. Address: 17803 La Salle Avenue, Gardena, CA (ph: 310-324-0620; fax: 310-324-7931; email: bioquip@aol.com; internet: www.bioquip.com). You might want to put in a combined order with your fellow students.

1. **Insect Boxes** (p. 10, BioQuip Catalog)
You will need to purchase 4 insect boxes. The most economical choice would be the 1009 Insect Box ($10.50 each), made of sturdy chipboard. Wooden boxes are more expensive, ranging in price from the 1001 Standard Insect Box ($23.30 each) to the 1006 Schmitt Box ($55.85 each). Some of you may already have your own insect boxes and you are welcome to use these, provided they are DERMESTID-FREE and of the appropriate size.

2. **Insect Pins** (p. 32, BioQuip Catalog)
We suggest that you order 1000 size 2 'Elephant' brand insect pins (#1202B). These pins are $49.50 per thousand. Be sure to specify the size (size 2) of the pins when ordering.

3. **Forceps** (p. 30, BioQuip Catalog)
You will need 2 pairs of fine (jeweller's style) forceps. The least expensive are the "Swiss Style" 4531 forceps ($6.25 per pair). Heavier forceps (e.g. #4731) and featherweights (e.g. #4750) are also useful for some specimen handling tasks.

4. **Insect Nets** (pp. 44-48, BioQuip Catalog)
For insect nets we recommend two 12" diameter nets, one with a medium sweep bag (7612MS @ $12.70) and one with an aerial bag (7612NA @ $11.50). These are quite serviceable nets, with wooden handles. More expensive light-weight nets with aluminum handles are also available (p. 45).

5. **Kill Jars** (p. 50, BioQuip Catalog)
The 1120 Series collecting jars are the most suitable. We recommend getting one large 32 oz. jar (1120C), one 16 oz. jars (1120B), and three or four pocket collecting jars (1120P).
The 1120 series jars have a cartridge which holds the killing agent. The latter can be either ethyl acetate (held in absorbent cotton) or cyanide crystals. BioQuip sells ethyl acetate (page 50 of the catalog) but not cyanide. Cyanide is actually the more effective killing agent. We will have a supply of ethyl acetate and potassium cyanide available for the first field trip (April 12).

6. **Other equipment needs**
Other supplies that you are responsible for procuring include:
1 pair of scissors (for cutting labels)
1 collecting bag (a shoulder bag is preferable so that you have easy access to vials, kill jars, etc.)
1 rapidograph pen (for writing labels; 0.25 mm or finer; indelible ink)
1 hardcover field notebook

Note: If you do NOT wish to keep your collection at the end of the quarter then we can supply you with **boxes** and **pins**, in return for the donation of the specimens.

Keeping a field notebook

We require that you keep a field notebook to record your collection activities. For each collecting site you should indicate the locality, elevation, coordinates (latitude and longitude), and date. Each sample from a given place, time, and microhabitat is tagged with a different, unique number called an ***accession number***. It is easiest to use a simple series of increasing numbers (#001, #002, #003, etc.). When you label your insect specimens the accession number should be written on the label, after your name.

For example, let's say that on a particular day you visit Stebbins Cold Canyon Reserve and that you make the following collections of insects: (i) a sweep sample from low vegetation, in

chaparral (ii) beetles under stones near the creek, and (iii) butterflies and bees from lupine flowers. Your collection notes for this day might look something like the following

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13 April 2003

CA Solano Co.: Stebbins Cold Canyon Reserve, 120m, 38°30′N
122°06′W.
#023  sweep sample from low shrubs, in chaparral
#024  beetles under stones, near creek
#025  on lupine flowers (bees, butterflies)
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COLLECTIONS

The insect collection that you prepare should have each specimen properly pinned (or point-mounted), accurately labeled, and identified to family. Organize the collection taxonomically, by order and family. Specimens can be collected both on field trips and on your own time, but specimens collected prior to the spring quarter cannot be used. The minimum requirement is **100 insect families.**

Due Date: Collections are due on the last day of class, the same day as the laboratory final (5 June 2003).

Specimen Exchange: You may engage in limited trading with other students in the class (no more than 5% of your specimens). The original labels must be left on any traded specimens, including the original collector's name.

Collection Assessment: As indicated in the class syllabus, your insect collection will be evaluated on the basis of (1) curation quality, (2) accuracy of identification, (3) taxonomic diversity, and (4) the condition of your field notebook.

PROJECT REPORT

We will discuss possible field projects with you as the course progresses. Basically, any study of insect ecology, behavior or natural history is acceptable. We hope that you will be motivated to ask questions based on your experience of the local insect fauna as well as your knowledge of ecology and evolution. Obviously, the field project must be tempered by time constraints and by the fact that the main focus of the class is insect taxonomy.

Your project report should be concise (3-4 typed pages). It is due **5 June 2003**.